



# Organizing Writing Around a Single Topic or Central Idea for an Interdisciplinary ELA/Science Unit-Anchor Activity

*Lesson: English Language Arts , Grade(s) 8*

This is a cooperative lesson (A Manned Mission to Mars) between ELA and science illustrating anchoring activities. In science class, students will gather data to prepare for writing the essay. In ELA, they will use the material gathered during pre-writing to create a finished product using GoMyAccess.

Duration: 2 Days

## Lesson

### Objectives

Students will:

- synthesize information about the characteristics of the Martian environment to evaluate whether a human colony can be established on Mars.
- prepare a position statement arguing for or against sending a manned mission to Mars, citing advantages and trade-offs of the position stated.

### Essential Questions

How does Earth's physical characteristics and motion compare to other bodies in the Solar System?

How has technology expanded our knowledge of the Earth, Moon, and Sun system?

### Warm-up Activity (Do Now)

Post in front of room:

- Write three reasons (complete sentences) why sending a manned mission to Mars would be a benefit to mankind.

### Instructional Strategies (including Differentiation)

- Grouping strategies: 4-2-1 strategy:
- Tiering strategies

### Student Activities

Background:

This activity occurs during the Planetary Science unit as part of Activity 13, The Solar System.. Students have been taught the definition of a planet, the concept of distance in space, and characteristics of Earth and other planets. In addition, students address the requirements for life in seventh grade.

Resources:

- Video clips from "Journey to Mars" *Scientific American Frontiers*.
- T-chart "Manned Mission to Mars vs. Lewis & Clark"
- Butcher paper and markers or on-line class chart.



## Lesson

### Sequence of Activities

1. Show the video clip "Out of Thin Air" from "Journey to Mars," *Scientific American Frontiers*, <http://vvi.onstreammedia.com/cgi-bin/visearch?user=pbs-saf&template=play220asf.html&query=ClipCategory:astronomyClipCategory:space&query=ClipID:2VideoAsset:pbssaf902&inputField=undefined&ccstart=242233&ccend=784933&videoID=pbssaf902>
2. Have students complete T-chart: Manned Mission to Mars vs. Lewis & Clark. (resource attached).
3. Create a master chart on butcher paper or as an on-line class chart where students submit their own similarities and differences. Students will add to their lists as needed for use in the final writing activity.
4. Show the clip "Why Go To Mars?" from "Journey to Mars" *Scientific American Frontiers*. [http://www.pbs.org/perl/media.cgirt=w&f=virage/scientific/pbssaf902\\_220k.asf&s=1365533&e=1877500](http://www.pbs.org/perl/media.cgirt=w&f=virage/scientific/pbssaf902_220k.asf&s=1365533&e=1877500)
5. Have each student create a three column chart.
6. As students complete this three column chart, their responses are posted on a piece of butcher paper or (if possible) a computer database that all students can access. Students should collect responses that support their position for the GoMyAccess prompt.

Column 1: Requirements for human beings: Have students list five specific requirements that must be on Mars for humans to survive. These requirements must specify quantitative data: how much water per person needs to be present? How much oxygen needs to be present? Students must indicate a reference for each item.

Column 2: Already there/can be made: From the list in column 1, students indicate which items are already present on Mars, as well as which items can be made from the raw materials already present on Mars. Students must indicate a reference for each item. Teachers may need to show more clips from *Journey to Mars* to give students useful information:

<http://vvi.onstreammedia.com/cgi-bin/visearch?user=pbs-saf&template=template.html&query=ClipCategory:astronomyClipCategory:space&category=ClipCategory:astronomyClipCategory:space&viKeyword=&submit=Search&page=3>

Column 3: Need to bring/obstacles: From the list in column 1, students indicate which items need to be brought from Earth. Students also list three obstacles that astronauts on a manned mission to Mars would encounter that could cause problems or even death.

7. Yes or No? Students will indicate three reasons why a manned mission to Mars would be a good idea and three reasons why a manned mission would be a poor idea. Each idea must be supported with rationale ("because" statement). As students complete this activity, their responses are posted on a piece of butcher paper or (if possible) a computer database that all students can access.

### Assessment of Student Learning

- Assessment for Student Activity 2: Use rubric for Anchoring Activity 1 (attached).
- Using the information gained from the various anchor activities, students will respond to the following prompt (found on GoMyAccess)

Prompt:

A Manned Mission to Mars

In the next few years, the United States plans to launch a manned spaceship to Mars to establish a human colony there. While some observers argue that such a mission is necessary for human knowledge to advance, others fear that the costs of such a mission are too high or that it may not even be possible with our present technology. Do you think this is a wise course of action or not?



## Lesson

Write a letter to the President of the United States that expresses your opinion of whether the United States should proceed with this course of action.

Important facts that may be relevant to your argument:

1. The United States has sent several unmanned missions to Mars. With our present technology, it takes approximately nine months to reach Mars. The estimated cost of a manned mission to Mars is approximately 20 billion dollars.
2. Mars is about the same size as Earth (a little smaller). Its atmosphere contains no oxygen. It does, however, contain carbon dioxide.
3. There is no liquid water on Mars today. However, there is abundant frozen water (ice) on the planet's surface. There is also evidence that the surface of Mars once contained oceans of water.
4. It is currently unknown if Mars ever supported life.

Rubric:

Characteristics of a level 5:

The respondent states a clear position in favor or against sending a manned spaceship to Mars to establish a human colony early in the letter. Sufficient rationales that support the position are scientifically accurate, are relevant to the position, are stated clearly and thoroughly, and are persuasive. The respondent also addresses opposing arguments (i.e. plays devil's advocate), explaining how the original position of the response may accommodate (or not accommodate) these arguments. Transitions are smooth and logical. A strong concluding paragraph ties together all points made in the letter and suggests a possible course of action for the President.

Characteristics of a level 4:

The respondent states a clear position in favor or against sending a manned spaceship to Mars to establish a human colony early in the letter. Sufficient rationales that support the position are scientifically accurate, are relevant to the position, and are stated clearly and thoroughly. Transitions are smooth and logical. The concluding paragraph ties together all points made in the letter. The letter contains few, if any, errors in standard written English, and these do not interfere with understanding.

Characteristics of a level 3:

The respondent states a position in favor or against sending a manned spaceship to Mars. The reader is able to recognize this position, but the position may not be stated early in the letter. Supporting rationales are scientifically accurate and clearly stated. However, the rationales may not be relevant to the position, thoroughly elaborated, or sufficient in number for full development of the position. There is a concluding paragraph, but it may not tie together all points made in the letter. The letter may contain some errors in standard written English that rarely interfere with understanding.

Characteristics of a level 2:

The respondent addresses the question posed by the prompt, but the position is unclear or ambiguous. Some points that relate to exploration of Mars are made, but these may not be connected to a central position, they may be scientifically inaccurate, or they may contain irrelevant (albeit accurate) information. No attempt to be persuasive is evident (e.g. the response is a list of facts or pseudo-facts). The concluding paragraph fails to address any of the points made in the letter. Several kinds of errors in standard written English interfere with understanding.

Characteristics of a level 1



## Lesson

The respondent fails to establish a position in favor or against sending a manned spaceship to Mars. No specific details are used to support any position. Alternatively, any details that are described are scientifically inaccurate, irrelevant to the prompt, or poorly stated. There is a general lack of unity, and no concluding paragraph exists. The response lacks any discernable purpose. The word choice is often general, repetitive, and/or confusing. Frequent and severe errors in standard written English interfere with understanding.

**Differentiation:** This project is composed of several anchor activities (identified below). Students may work on anchor activities at home, after regular work is completed, or at other times as decided by the teacher. The quality of the anchor activities will determine what level of detail and accuracy the responses on the writing prompt will have.

### Closure/Summary

Students will discuss (whole group discussion) whether or not they believe NASA should fund a manned mission to Mars. Students must provide evidence that they have organized information gleaned in the student activities around a central position of whether or not NASA should fund this mission.

### Teaching Tips

- Warm-up activity: There are many reasons students can think of not to send a manned mission to Mars. This warm-up activity will establish a context in which any ranking official might consider sending people to Mars.
- 4-2-1 grouping strategy: Students brainstorm ideas for the activity in groups of four (perhaps when video clips are shown.) Students work in pairs, then individually to refine their ideas in the various anchoring activities.
- Tiering strategies: Students at high readiness levels do not need the structure that other students will need. These students can spend available time out of class researching the information relevant to these anchoring activities. The students can spend available time in class comparing their findings to those of others (through the class charts or through conversations with peers).
- Do not attempt to show the entirety of "Journey to Mars" in one sitting. Students will become bored and will not retain any useful information.
- Identify misconceptions that may occur or prior knowledge students have brought with them in Properties of Matter.

## Standards Covered

### ELA.8.1 Writing

- ELA.8.1.1 Writers will produce texts that exhibit the following text features, all of which are consistent with the genre and purpose of the writing: development, organization, style, and word choice.
- ELA.8.1.3 Writers will produce examples that illustrate the following discourse classifications: by the completion of the grade, writers will be able to write persuasive, informative, and expressive.
- ELA.8.1.4 Categories of GLEs
  - ELA.8.1.4.a10 Students understand that writing has an intended audience. In order to meet the needs of that audience, students write to an audience that can be increasingly distant (e.g., unknown but familiar personalities/roles such as local politicians, in addition to more familiar "others" from previous grades)
  - ELA.8.1.4.a8 Students understand that writing has an intended audience. In order to meet the needs of that audience, students communicate necessary background information and/or definitions.

## Materials

For a closer look at the materials list below, log onto <http://redclay.schoolnet.escholar.com>



## Materials

### *Resources:*

1. Anchor activity 1: T chart for "Scientific American Frontiers--Journey to Mars"
2. Rubric for Anchor Activity 1: T chart for "Scientific American Frontiers--Journey to Mars"
3. Scientific American Frontiers--Journey to Mars video clips

## Additional Properties

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